

### **REMARKS**

In view of the following remarks, the Examiner is respectfully requested to withdraw the rejections and allow Claims 21-45 and 48, the only claims pending and currently under examination in this application.

Claims 21-45 and 48 have been examined and rejected.

Claims 1-20 have been previously cancelled.

Claims 46-47 have been previously withdrawn.

Claims 21, 37, 40, 44, and 48 have been amended for clarification. Support for these amendments can be found in the specification, for example, on p. 14, lines 29-32; Figures 6-8 and p. 15, line 5 to p. 16, line 2. Claim 27 has been amended for clarification. Support for this amendment is found, for example, in original Claim 6, and p. 17, lines 10-18. Accordingly, no new matter has been added. As no new matter has been added by way of these amendments, entry thereof by the Examiner is respectfully requested.

### ***Claim Rejections - 35 U.S.C. § 112***

The Applicants note that the previous rejection of Claims 21-45 and 48 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement has been withdrawn.

### ***Claim Rejections - 35 U.S.C. § 102(a)***

Claims 21-45 and 48 have been rejected under 35 U.S.C. § 102 (a) as being anticipated by Blanchard (WO 98/41531).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The standard for anticipation under section 102 is one of strict identity. An anticipation rejection requires a showing that each limitation of a claim be found in a

single reference, *Atlas Powder Co. v. E.I. DuPont de Nemours & Co.*, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984). Further, an anticipatory reference must be enabling, see *Akzo N.V. v. United States Int'l Trade Comm'n* 808 F.2d 1471, 1479, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986), cert denied, 482 U.S. 909 (1987), so as to place one of ordinary skill in possession of the claimed invention. To anticipate a claim, a prior art reference must disclose every feature of the claimed invention, either explicitly or inherently. *Glaxo v. Novopharm, Ltd.* 334 U.S. P.Q.2d 1565 (Fed. Cir. 1995).

An element of the rejected claims 21 and 40 and the claims which depend from them is an apparatus for fabricating an addressable array of biopolymer probes, which includes a sensor, which senses at least one operating parameter wherein the sensor views at least one of: a dispensing head; a nozzle; and a droplet pattern previously dispensed from said head, wherein said viewing comprises capturing one or more images of said droplet pattern; and a corrected drive pattern different from the target drive pattern such that use of the corrected drive pattern results in a reduced discrepancy between the target and actual array patterns.

An element of independent claims 37 and 44 is an operating parameter derived by viewing at least one of a dispensing head; a nozzle; and a droplet pattern previously dispensed from said head, wherein said viewing comprises capturing one or more images of said droplet pattern, and a corrected drive pattern different from the target drive pattern such that use of the corrected drive pattern results in a reduced discrepancy between the target and actual array patterns. Independent Claim 38 has the element of "...a sensor to sense the position of at least one fiducial mark on the dispensing head...".

In maintaining the rejection, the Examiner alleges that Blanchard anticipates the current claims. The Examiner has stated that Blanchard teaches "where the sensor views droplets previously dispensed from a dispensing head (page 78, line 24- page 79, line 12) (Office Action of 2/7/2008, p. 5) and that "by recording that pattern of where the droplets are to be deposited, Blanchard teaches where the sensor views droplet patterns previously dispensed from a dispensing head" (Advisory Action, p. 5).

The Applicants respectfully disagree. It is not clear to the Applicants what the Examiner means by the statement that "by recording that pattern of where the drops are to be deposited, Blanchard teaches where the sensor views droplet patterns

previously dispensed from a dispensing head." The Examiner has not pointed to where in the specification Blanchard discloses either recording of the pattern of where drops are to be deposited, or of viewing droplet patterns previously dispensed.

As stated in the previous response, the portion of Blanchard cited by the Examiner discloses a digital image taken by a camera to identify a registration mark, as disclosed below:

"Typically, the registration mark will not be rotated more than one degree or so from its aligned position. A semi-vertical line and a semi-horizontal line can be identified from the array of pixels because one of the two lines in the registration mark will appear to be vertical and the other to be horizontal. The program calculates the equation for the semi-vertical line (step 1703). Similarly, the program calculates the equation for the semi-horizontal line (step 1704). The program then calculates the intersection of the two lines and records the position (step 1705). If the current and previous calculations of the position of the registration mark agree within some tolerance, the program returns the calculated position as the center position of the registration mark (steps 1707-1708). If they don't agree or any of the steps requires to estimate the position fails, the program re-tries at step 1701." (p. 78 line 29-p. line 12)

The method disclosed in Blanchard is therefore to measure two lines, calculate the intersection of the lines (the registration mark), and compare the position with previous positions. The Applicants argue that Blanchard does not disclose viewing "a droplet pattern previously dispensed from said head", because the camera in Blanchard is designed to locate the substrate marks made by marker 50, as further disclosed below:

"Frame capture circuit 110 receives a video signal from camera 52 and provides a two-dimensional array of pixel values for use by computer 100. Frame capture circuit 110 and the digital image it produces are used to locate the substrate marks made by marker 50 and to thereby determine any necessary compensation in positioning the substrate with respect to the print head." (p. 69, lines 6-13)

Furthermore, Blanchard further discloses that:

"In use, the initial positioning and alignment of a substrate is recorded by scoring two marks on the substrate. Preferably, a cross or X is made on two opposite ends or corners of the substrate. During subsequent handling of a particular substrate, each mark is positioned over lens 60 and its precise position is recorded. This information is used to calculate horizontal correction factors in the X and Y directions, and to calculate rotational misalignment." (p. 64, lines 3-11)

In other words, the digital image obtained in Blanchard is used to "locate the substrate marks", which are (preferably) positioned "on two opposite ends or corners of the substrate". These substrate marks are then "positioned over lens 60" of camera 52. The use of the camera in Blanchard is additionally disclosed as follows:

"Scanning arm 44 moves the wafer such that the first registration mark will be centered over the center of camera 52 if the alignment was already correct (step 1306). This should place the registration mark somewhere in the camera's field of view. The center position of the cross of the first registration mark is measured (step 1307). Scanning arm 44 moves the wafer such that the second registration mark on the wafer will be centered over the center of the camera if the alignment was already correct (step 1308). The center position of the cross of the second registration mark is measured (step 1309). The program calculates the angle that the wafer is rotated away from a perfectly aligned position from the measured positions of the two registration marks (step 1400). The program then calculates the direction and the magnitude of the deflection of rotational adjustment pin 48 required to correct the above rotation (step 1401). The rotational adjustment pin is bumped against the vertical reference pin to correct the rotation (step 1402). The scanning arm moves the wafer so that the second registration mark is now over the center of the camera (step 1403). The program executes the Go home routine for calculating the X and Y-position adjustments such that the center of the registration mark is located directly over the center of the camera (step 1404)." (p. 76, line 32 to p. 77, line 25)

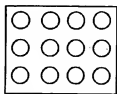
The Applicants therefore maintain that nowhere does Blanchard disclose "where the sensor views droplet patterns previously dispensed from a dispensing head", or "wherein said viewing comprises capturing one or more images of said droplet pattern", because Blanchard only discloses use of the camera to locate the registration marks.

Furthermore, as discussed in the previous response, there is no disclosure in Blanchard of deriving a corrected drive pattern different from the target drive pattern such that use of the corrected drive pattern results in a reduced discrepancy between the target and actual array patterns.

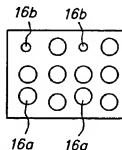
There is no disclosure of this element in Blanchard, because the "error" detected in Blanchard is a difference in positions of the registration mark. There is no disclosure of sensing a droplet pattern previously dispensed from the head wherein said viewing comprises capturing one or more images of said droplet pattern, and there is further no disclosure of deriving a corrected drive pattern.

This is in contrast to the Applicants' invention, in which one element of the claims is to derive a corrected drive pattern from viewing a droplet pattern previously

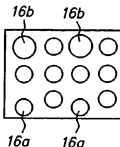
dispensed from the head, wherein said viewing comprises capturing one or more images of said droplet pattern. This is clearly disclosed in both the specification and figures as shown below:



**FIG. 6**



**FIG. 7**



**FIG. 8**

As disclosed in the specification (p. 15, line 5 – p. 16, line 3), FIG. 6 represents an image in memory of a portion of the target drive pattern, which corresponds to the appearance of the target array pattern with normal operation. However, if the processor determines there is an error in relative orientation of the nozzle of the head which produces spots 16a, or if an error is determined in fluid volumes deposited by the nozzle which produces spots 16b, the processor can then derive a corrected drive pattern. The processor does this by comparing the image in memory (FIG. 6) with the actual droplet pattern (e.g. FIG. 7). A corrected drive pattern can then be derived, which incorporates an inverse of the determined errors. That is, in order to correct for displacement (in the upward direction as viewed in FIG. 7) of spots 16a, the actual drive image will contain an instruction to move the head lower (as viewed in FIG. 8) than the nominal position of FIG. 6 to compensate for the displacement in FIG. 7. Similarly, to correct for the below expected volume (that is, the nominal volume) produced by the jets producing features 16b, the actual

drive image will contain an instruction for that jet to fire multiple spots or with more energy (this appearing as enlarged features 16b in FIG. 8) to compensate for the low volume error. While the illustrated errors in FIG. 7 relate to individual spots, other errors can be general in that they relate to all spots.

The "error" in Blanchard is therefore simply a difference in positions of the registration mark. There is no disclosure of either a sensor which views a droplet pattern, or an operating parameter derived from viewing a droplet pattern previously dispensed from the head wherein said viewing comprises capturing one or more images of said droplet pattern. There is also no element of deriving a corrected drive pattern in Blanchard, because Blanchard only discloses correcting the alignment of the substrate.

With respect to Claim 38, there is no disclosure in Blanchard of a sensor to sense the position of at least one fiducial mark on the dispensing head. There is no disclosure of this element in Blanchard because the sensor taught by Blanchard is positioned in his apparatus such that it cannot view the dispensing head.

As discussed in the previous response, Blanchard's Fig. 5 shows the synthesis system, Fig. 6 shows the inkjet print heads used in the system of Fig. 5, and Fig. 8 shows "an alignment unit" of Fig. 5 (see page 9, lines 11-19). The "print head assembly 24" of Fig. 6 "comprises two print heads 36, mounted within an aluminum block 38" (page 58, line 29). The print heads "are directed upwardly, to deposit liquid on a substrate that is positioned over the print heads" (page 59, lines 9-12). On the other hand the "Alignment unit 26 comprises a marker 50 and a camera [sensor] 52", and the marker "comprises a diamond tip or point that can be raised or lowered in response to activation and deactivation by solenoid 54" to contact and mark an "adjacent substrate" (page 63, lines 6-17). Note that in Fig. 8 the marker 50 and the camera [sensor] 52 face upwardly (in the same direction as the print heads of print head assembly in Fig. 6). This is consistent with the marker being "raised or lowered" into contact with the substrate. Furthermore, after a mark is made on the substrate it can then be "positioned over lens 60" to have its position determined (page 64, lines 6-9).

Thus, from the above, it is apparent that Blanchard's print heads and camera (sensor) both face upwardly and the camera does not (and indeed, cannot) view the print heads or nozzle.

Accordingly, the Applicants contend that Blanchard is deficient in that it fails to teach each and every element of the rejected claims, namely, Blanchard does not teach a sensor which views at least one of a dispensing head, a nozzle, and a droplet pattern previously dispensed from said head, wherein said viewing comprises capturing one or more images of said droplet pattern, wherein a corrected drive pattern is derived based on the error detected by said sensor, as in Claims 21 and 40. Blanchard also fails to teach at least one operating parameter derived by viewing a droplet pattern previously dispensed from said head, wherein said viewing comprises capturing one or more images of said droplet pattern, wherein a corrected drive pattern is derived based on the error detected by said sensor, as in Claims 37 and 44. Blanchard also fails to teach the element of a sensor to sense the position of the at least one fiducial mark on the dispensing head, as in Claim 38. Therefore, the Applicants respectfully request that the 35 U.S.C. § 102(b) rejection of Claims 21-45 and 48 under 35 U.S.C. § 102 (b) over Blanchard (WO 98/41531) be withdrawn.

**CONCLUSION**

Applicants submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone Bret Field at (650) 327-3400.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-1078.

Respectfully submitted,

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